

SPECIFICATION

COMPUTER COMPONENT MOUNTING SYSTEM

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

[0001] The present invention relates to component mounting systems, and particularly to a computer component mounting system incorporating guide structures for facilitating assembly thereof.

2. RELATED ART

[0002] Modern high-speed central processing units (CPUs) generate copious amounts of heat which needs to be efficiently dissipated. A typical computer system incorporating a CPU often includes one or more fans to cool the CPU.

[0003] Taiwan Pat. Pub. No. 313279 discloses a mounting structure capable of mounting a plurality of fans within a computer enclosure. The mounting structure comprises a main body. A plurality of catch means is formed on a central portion of the main body, for holding the fans thereon. A plurality of spring fingers and clips is formed on a periphery of the main body, for attaching the mounting structure to a rear panel of the enclosure. The mounting structure has the following shortcomings. Firstly, the rear panel must have a plurality of engaging means corresponding to the plurality of spring fingers, clips and catches of the mounting structure. This makes a structure of the enclosure unduly complicated. Secondly, in assembly, the spring fingers, clips and catches of the mounting structure are required to be accurately aligned with the corresponding engaging means of the rear panel prior to inter-engagement therebetween. This reduces an efficiency of assembly. Thirdly, the mounting structure can be only attached to the rear panel of the enclosure. Thus, the mounting structure can only position the fans adjacent a rear portion of the enclosure. If CPU is located in a position

other than the rear portion, the efficacy of the fans is reduced.

[0004] US Pat. No. 6,244,953 discloses a mounting bracket for a single fan. The fan is received in the bracket, and the combined fan and bracket is readily hung on a rear panel of an enclosure. However, the mounting bracket can install only one fan on the rear panel. When several fans need to be installed, several mounting brackets need to be hung one by one. This is unduly costly and laborious.

[0005] Thus, a new mounting apparatus for a fan which overcomes the above-mentioned problems is desired.

SUMMARY OF THE INVENTION

[0006] Accordingly, an object of the present invention is to provide a computer component mounting system for readily attaching one or more computer components such as fans within a chassis.

[0007] Another object of the present invention is to provide an inexpensive computer component mounting system capable of mounting a plurality of computer components such as fans at one time.

[0008] To achieve the above-mentioned objects, a computer component mounting system in accordance with a preferred embodiment of the present invention comprises a chassis having a pair of opposite side panels, a pair of mounting frames attached to insides of the side panels respectively, and a mounting bracket for holding one or more computer components such as fans. Each mounting frame comprises a base plate, and a pair of side plates extending from opposite sides of the base plate. A positioning plate extends perpendicularly from a top edge of the base plate. A pair of symmetrically diverging guide plates extends upwardly obliquely from top edges of the side plates. A locking slot is

defined in each side plate and adjoining guide plate. The mounting bracket comprises a main portion for holding the fans, and a pair of mounting portions at opposite ends of the main portion. Each mounting portion comprises a pair of locking tabs corresponding to the locking slots of a corresponding mounting frame, and a positioning tab corresponding to the positioning plate of the corresponding mounting frame. The locking tabs of the mounting bracket are engaged in the locking slots of the corresponding mounting frame respectively, and the positioning tabs of the mounting portions and the mounting frames are joined together, thereby securing the mounting bracket to the mounting frames. The fans are thus secured within the chassis.

[0009] Other objects, advantages and novel features of the present invention will be drawn from the following detailed description of the preferred embodiment of the present invention with the attached drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Fig. 1 is an exploded, isometric view of a computer component mounting system in accordance with the preferred embodiment of the present invention, together with a fan and a fan housing;

[0011] Fig. 2 is an enlarged view of a mounting bracket of the mounting system of Fig. 1;

[0012] Fig. 3 is an enlarged view of one mounting frame of the mounting system of Fig. 1;

[0013] Fig. 4 is an assembled view of Fig. 1; and

[0014] Fig. 5 is an enlarged view of an encircled portion V of Fig. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] Referring to Figs. 1 through 3, a computer component mounting system of the present invention is for mounting one or more computer components such computer fans 100 (only one shown). A preferred embodiment of the mounting system comprises a mounting bracket 10 for holding the fans 100, a chassis 50 having two opposite side panels 52, and two mounting frames 30 attached to the side panels 52 respectively.

[0016] The mounting bracket 10 comprises a flat main portion 12, and two mounting portions 13 formed at opposite ends of the main portion 12 respectively. The main portion 12 is used for holding the fans 100 thereon. A plurality of air openings 120 (only two air openings 120 are illustrated in Fig. 1) is defined in the main portion 12. A plurality of mounting slots 122 is defined in the main portion 12 around each air opening 120. In the preferred embodiment, three mounting slots 122 are defined around an upper portion of each air opening 120, and two mounting slots 122 are defined below each air opening 120.

[0017] Each mounting portion 13 comprises first and second parallel plate portions 14, 16 at opposite rear and front sides thereof respectively. The first plate portion 14 extends coplanarly from a corresponding end of the main portion 12, and the second plate portion 16 is bent perpendicularly from a front side of the mounting portion 13. In fact, the first plate portion 14 essentially split from the mounting portion 13 with an opening 131 left therein. A first vertical locking tab 140 extends perpendicularly rearwardly from an outer side edge of the first plate portion 14. A second vertical locking tab 160 extends perpendicularly forwardly from an outer side edge of the second plate portion 16. A horizontal positioning tab 15 extends perpendicularly outwardly from a top edge of the mounting portion 13. A positioning hole 152 is defined in the positioning tab 15.

[0018] Each mounting frame 30 comprises a base plate 32, and two parallel side plates 36 extending perpendicularly from opposite sides of the base plate 32 respectively. The base plate 32 and side plates 36 cooperatively define a space

therebetween for receiving a corresponding mounting portion 13 of the mounting bracket 10. A distance between the side plates 36 is substantially equal to a distance between the first and second plate portions 14, 16 of the mounting portion 13, so that the mounting portion 13 can be fittingly received in said space. A positioning plate 322 extends perpendicularly inwardly from a top edge of the base plate 32, corresponding to the positioning tab 15 of the mounting portion 13. A positioning hole 324 is defined in the positioning plate 322. A pair of L-shaped mounting plates 34 extends outwardly from the base plate 32, for attachment to a corresponding side panel 52. Each mounting plate 34 defines a mounting hole 342 in an end portion thereof. A pair of screw holes 54 is defined in each side panel 52, corresponding to the mounting holes 342 of a respective mounting plate 34. The mounting system further comprises two pairs of screws 60, for extension through the mounting holes 342 and screw holes 54 to thereby fasten the mounting frames 30 to the side panels 52 respectively.

[0019] A pair of symmetrically diverging guide plates 362 extends obliquely upwardly from top edges of the side plates 36 respectively. One of the guide plates 362 extends upwardly and rearwardly, and the other guide plate 362 extends upwardly and forwardly. The guide plates 362 are for guiding the mounting portion 13 into said space of the mounting frame 30. A locking slot 364 is defined in each side plate 36 and adjoining guide plate 362, for receiving the first and second locking tabs 140, 160 of the mounting portion 13 therein. The locking slot 364 progressively tapers, with a width of an upper portion of the locking slot 364 being greater than a width of a lower portion thereof. The width of the lower portion of the locking slot 364 is substantially equal to a thickness of a corresponding first locking tab 140 or second locking tab 160.

[0020] A fan housing 110 is provided for receiving the fan 100 therein. The housing 110 is made of resilient material such as plastic. Three spring fingers 112 extend from three adjoining peripheral walls of the housing 110 respectively,

corresponding to the three mounting slots 122 that are around the upper portion of a respective air opening 120. A protrusion 114 is outwardly formed on an end of each spring finger 112. A pair of clips 116 depends from bottom corners of the housing 110 respectively, corresponding to the two mounting slots 122 that are below the air opening 120.

[0021] Referring to Figs. 4 and 5, in assembly, the mounting frames 30 are attached to inner sides of the side panels 52 of the chassis 50 respectively with the screws 60. The fan 100 is received in the housing 110. The combined fan 100 and housing 110 is attached to the main portion 12 of the mounting bracket 10 at the respective air opening 120, with the spring fingers 112 and clips 116 engaging in the corresponding mounting slots 122. That is, the clips 116 are extended into the mounting slots 122 that are below the air opening 120, and the combined fan 100 and housing 110 is pressed toward the mounting bracket 10 to enable the protrusions 114 of the spring fingers 112 to snappingly engage in the mounting slots 122 that are around the upper portion of the air opening 120.

[0022] The mounting bracket 10 is positioned above the mounting frames 30. The first and second plate portions 14, 16 of the mounting portions 13 of the mounting bracket 10 are aligned with the side plates 36 of the mounting frames 30 respectively. The mounting portions 13 are moved down into said spaces of the mounting frames 30, with the first and second plate portions 14, 16 being guided into said spaces by the corresponding guide plates 362 of the side plates 36. The first and second locking tabs 140, 160 enter the upper portions of the corresponding locking slots 364, and are fittingly received in the lower portions of the locking slots 364. During this process, the tapered configurations of the locking slots 364 guide downward movement of the mounting portions 13. The positioning tabs 15 of the mounting portions 13 abut the positioning plates 322 of the mounting frames 322 respectively, with corresponding positioning holes 152, 324 being aligned with each other. Two fasteners (not shown) are extended

through the respective aligned positioning holes 152, 324, thereby securing the mounting bracket 10 to the mounting frames 30. The fan 100 is thus secured within the chassis 50. A position of the fan 100 corresponds to an electronic component such as a CPU within the chassis 50 which requires cooling.

[0023] In the present invention, the mounting bracket 10 and the mounting frames 30 of the mounting system have relatively simple structures, and can be easily manufactured by multiple stamping processes. This leads to low manufacturing costs. In addition, the mounting frames 30 are attached to the side panels 52 of the chassis 50 by conventional means. Therefore, the mounting system can be readily adapted for use with a variety of different kinds of chassis. Moreover, the guide plates 362 of the mounting frames 30 readily facilitate assembly of the mounting system.

[0024] In the preferred embodiment of the present invention, the positioning tabs 15 of the mounting bracket 10 are mounted to the positioning plates 322 of the mounting frames 30 by the two fasteners. In an alternative embodiment, the positioning tabs 15 and positioning plates 322 may be joined together by other suitable means such as snapping inter-engagement means.

[0025] It is understood that the invention may be embodied in other forms without departing from the spirit thereof. Thus, the present examples and embodiments are to be considered in all respects as illustrative and not restrictive, and the invention is not to be limited to the details given herein.